

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An apparatus comprising:

a pipeline of elements processing print control data and having:

a plurality of print head drivers, each of which controls the application of colorant to a sheet and has an input port receiving data signals;

a plurality of raster image processors, each of which has an output port communicating with the input ports of said plurality of print head drivers to deliver thereto data signals controlling the application of colorant to a sheet and an input port receiving parsed page data; and

a sequencer which has an output port networked and communicating with, and directly connected to, the input ports of said plurality of raster image processors and an input port receiving a print data stream, said sequencer monitoring data flows among the pipelined elements and parsing a print data stream into local data portions related to individual pages and global state data portions related to characteristics shared across a plurality of pages, said sequencer packaging together parsed page local and global state data portions;

said raster image processors processing in parallel packaged parsed page data related to a plurality of pages and generating data signals to be communicated to said print head drivers as directed by said sequencer,

wherein the sequencer's said output port is connected to the raster image processors' said input ports, and wherein said raster image processors may be connected and disconnected to said sequencer output port, said sequencer

remaining unchanged by additions and removals of connected and disconnected
said raster image processors.

2. (previously presented) An apparatus according to Claim 1 wherein said sequencer queues packaged individual page data to be communicated to said raster image processors and further wherein individual ones of said raster image processors draw from said queued data as processing of data related to an individual page is completed and generated data signals are communicated to a print head driver.

3. (previously presented) An apparatus according to Claim 1 wherein each of said raster image processors converts data from a form communicated as a print data stream to a form to be communicated as data signals to a print head driver.

4. (previously presented) An apparatus according to Claim 3 wherein each of said raster image processors converts data from a form communicated as a print data stream into a variable number of portions depending upon whether an individual page is to be blank or to be printed with a single color or to be printed with multiple colors.

5. (currently amended) An apparatus comprising:

a pipeline of elements connected between a print server and a printer and processing print control data from said print server, and said pipeline of elements having:

a plurality of print head drivers, each of which controls the application of colorant to a sheet and has an input port receiving data signals;

a plurality of raster image processors, each of which has an output port communicating with the input ports of said plurality of print head drivers to deliver thereto data signals controlling the application of colorant to a sheet and an input port receiving parsed page data; and

a sequencer which has an output port networked and communicating with the input ports of said plurality of raster image processors and an input port

receiving a print data stream, said sequencer monitoring data flows among the pipelined elements and parsing a print data stream into local data portions related to individual pages and global state data portions related to characteristics shared across a plurality of pages, said sequencer packaging together parsed page local and global state data portions;

said plurality of raster image processors processing packaged parsed page data related to a plurality of pages in parallel and generating data signals to be communicated to said print head drivers as directed by said sequencer, each of said raster image processors converting data from a form communicated as a print data stream into a variable number of bit maps depending upon whether an individual page is to be blank or to be printed with a single color or to be printed with multiple colors,

wherein the sequencer's said output port is connected to the raster image processors' said input ports, and wherein said raster image processors may be connected and disconnected to said sequencer output port, said sequencer remaining unchanged by additions and removals of connected and disconnected said raster image processors.

6. (currently amended) A method comprising the steps of:

changing the number of raster image processors in a pipeline of elements including a sequencer, said raster image processors and print head drivers, wherein said sequencer remains unchanged by additions and removals of connected and disconnected said raster image processors;

receiving a print data stream from a print server and parsing the stream into local and global portions;

packaging together parsed local and global print stream data portions;

queuing packaged print stream data portions in said sequencer;

communicating queued packaged print stream data portions directly over a network to a plurality of raster image processors;

processing a plurality of communicated packaged print stream data portions in parallel to generate print head driving data signals from said print head drivers; and communicating the generated print head driving data signals from said print head drivers to a printer and to the print heads of said printer.

7. (original) A method according to Claim 6 wherein said step of packaging print stream data portions comprises packaging portions applicable to individual pages.

8. (original) A method according to Claim 6 wherein said step of processing comprises generating bit map data signals.

9. (currently amended) A computer program product comprising a computer readable medium with program instructions stored thereon and effective when executed by a computer system to cause the computer system to:

configure a pipeline of elements responsive to the number of raster image processors in said pipeline of elements, said pipeline of elements including a sequencer, said raster image processors and print head drivers, wherein the number of said raster image processors may be changed and said pipeline of elements reconfigured for the changed number, said sequencer remaining unchanged by changing the number of said raster image processors;

receive a print data stream from a print server and parse the stream into local and global portions;

package together parsed local and global print stream data portions;

queue packaged print stream data portions;

communicate queued packaged print stream data portions directly to a plurality of raster image processors;

process a plurality of communicated packaged print stream data portions in parallel to generate print head driving data signals; and

communicate the generated print head driving data signals to a printer and to the print heads of said printer.

10 – 11 (canceled).

12. (new) An apparatus as in claim 1, wherein the configuration of said pipeline of elements is changed responsive to additions and removals of connected and disconnected said raster image processors.

13. (new) An apparatus as in claim 5, wherein the configuration of said pipeline of elements is changed responsive to additions and removals of connected and disconnected said raster image processors.